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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,141	03/17/2004	Nagesh Sonti	215P011709-US (PAR)	3267

2512 7590 06/05/2008

PERMAN & GREEN
425 POST ROAD
FAIRFIELD, CT 06824

EXAMINER
KESSLER, CHRISTOPHER S

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
06/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,141	SONTI ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER KESSLER	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19,20,22-32,35,37-39 and 41-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-20, 22-32, 35, 37-39 and 41-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Responsive to the amendment filed 4 March 2008, Claims 19, 23-26, 35, 41, and 43 are amended. Claims 19-20, 22-32, 35, 37-39 and 41-47 are currently under examination.

Status of Previous Rejections

2. Responsive to the amendment filed 4 March 2008, the independent claims have been amended. New grounds for rejection are presented.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 19-20, 22-24, 27-30 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 5,451,275 issued to Amateau et al. (hereinafter "Amateau"), in view of U. S. Patent 6,729,171 issued to Ladousse et al. (hereinafter "Ladousse").

Regarding claim 19, Amateau describes the invention substantially as claimed. Amateau describes a method comprising the steps of

> (a) heating a metal workpiece in the form of a near net shaped gear blank having gear teeth surfaces above its critical temperature to obtain an austenitic structure throughout its surfaces;
>
> (b) isothermally quenching the workpiece at a rate greater than the critical cooling rate of its surfaces to a uniform metastable austenitic temperature just above the martensitic transformation temperature;
>
> (c) rolling the gear teeth surfaces of the workpiece to a desired outer peripheral profiled shape between opposed dies, each die having an outer peripheral profiled surface, while holding the workpiece at the uniform metastable austenitic temperature. the gear teeth surfaces undergoing densification. plastic deformation and strengthening as a result of the rolling operation; and
>
> (d) cooling the workpiece through the martensitic range to thereby harden the surfaces of the gear teeth.

More specifically, in claim 1, Amateau describes;

(b) heating a workpiece in the form of a near net shaped gear blank having carburized gear teeth surfaces above its critical temperature to obtain an austenitic structure throughout its carburized surfaces;
(c) isothermally quenching the gear blank at a rate greater than the critical cooling rate of its carburized surfaces to a uniform metastable austenitic temperature just above the martensitic transformation temperature;
(d) holding the temperature of the gear blank at said uniform temperature while rolling the gear teeth surfaces between a pair of diametrically opposed rolling gear dies to a desired shape before martensitic transformation occurs; and
(e) cooling the gear through the martensitic range for the carburized gear surfaces to harden the gear surfaces.

Amateau does not disclose wherein the workpiece is a powder metal workpiece. Amateau describes roll-finishing the gear (see Title, for example), but does not describe wherein the dies have a powder metal gear tooth finishing surface configured to geometrically finish the powder metal surface of each tooth during rolling. One of ordinary skill in the art will readily appreciate that the dies used for roll finishing a wrought gear blank, as taught by Amateau cannot be used to roll finish a powder metal gear blank of similar size due to the difference in density of the materials.

Ladousse teaches a method of rolling gears from powder metal sintered blanks (see Abstract). Ladousse teaches that the method uses dies (tools) with a peripheral geometry designed to impart the appropriate shape to the powder metal blank (see cols. 1-3, cols. 11-12). Ladousse teaches that this may be done with opposed dies (tools) (see cols. 3-6, Figs. 1-5). Ladousse teaches that the method may be used to size or finish the gear shape (see cols. 11-12), thus meeting the limitation of each die having an outer peripheral powder metal gear tooth finishing surface configured to geometrically

finish the powder metal surface of each tooth during rolling. Ladousse teaches that the use of sintered powder blanks is desirable because these are "very economical to produce" (see col. 7).

It would have been obvious to one of ordinary skill in the art at time of invention to substitute a powder metal gear blank as taught by Ladousse for the hobbed gear blank disclosed in Amateau, because Ladousse teaches that the powder metal blanks are economical to produce (see col. 7).

Regarding claim 20, additional steps (e) and (f) claimed by applicant would be inherent in step (d) of Amateau shown above, if that step were performed as stated above on a powder metal gear blank (see MPEP §2112). Compaction under high temperature (hot working) is well established in the art to cause pores of a sintered PM workpiece to collapse and to cause the workpiece to plastically deform. Ladousse further teaches that the gear is compacted and density changes during the compaction process (see cols. 7-13).

Regarding claim 22, Amateau and Ladousse are applied to the claim as stated above. Densification is well known in the art to be the primary goal of sintering operations, and is thus an inherent part of sintering (see MPEP §2112).

Regarding claim 27, Amateau is applied to the claim as stated above. Ladousse discloses wherein the powder metal workpiece is pressed and sintered prior to rolling (see cols. 1-2).

Regarding claim 23, Ladousse discloses wherein the powder metal workpiece is pressed and sintered prior to rolling (see cols. 1-2), meeting the definition of single pressing the workpiece.

Regarding claim 24, Ladousse discloses wherein the powder metal workpiece is pressed and sintered prior to rolling (see cols. 1-2), meeting the definition of single sintering the workpiece.

Regarding claim 28, Amateau is applied to the claim as stated above. Ladousse teaches that common densification thicknesses are described in the art which fall within the claimed range (see cols. 8-9). Ladousse further teaches that the densification thickness is chosen by one of ordinary skill in the art depending on the density and material of the blank, and the geometry of the dies (see cols. 10-12). Thus densification thickness is a results-effective variable and would have been optimized by one of ordinary skill in the art without undue experimentation. Applicant is further directed to MPEP 2144.05.

Regarding claim 29, Amateau discloses fabricating a parallel axis gear (see col. 2, lines 9-44).

Regarding claim 30, Amateau discloses fabricating helical gears and spur gears (see col. 2, lines 9-44).

Regarding claim 47, Amateau and Ladousse are applied to the claim as stated previously. Amateau in view of Ladousse does not teach wherein the root/fillet region of the gear teeth are compacted with a rolling die having a tip radius from about 0.014 to about 0.018 inches.

Ladousse teaches that the tool may have teeth (see cols. 11-12). Ladousse teaches that the teeth are homologous to the gear being made (see cols. 11-12). Thus, the tip radius is a results-effective variable with regard to the geometry of the gear to be formed, and would have been optimized by one of ordinary skill in the art without undue experimentation. Applicant is further directed to MPEP 2144.05.

5. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amateau in view of Ladousse as applied to the claims above, and further in view of Applicant's Admitted Prior Art.

Regarding claim 25, it is well known in the art to combine sintering and hardening operations into an integrated operation. It is well known in the art to introduce a hardening or carburizing atmosphere during sintering. For example, Applicant has shown "atmospheric sintering" in Fig. 6 of the instant specification, which is directed to prior art powder metallurgy processes. It would thus be obvious to one of ordinary skill in the art to use an integrated sintering and hardening operation during atmospheric sintering in order to save time and money in processing.

Regarding claim 26, it is well known in the art to combine sintering, hardening and carburizing operations into an integrated operation. It is well known in the art to introduce a hardening or carburizing atmosphere during sintering. For example, Applicant has shown "atmospheric sintering" in Fig. 6 of the instant specification, which is directed to prior art powder metallurgy processes. It would thus be obvious to one of

ordinary skill in the art to use an integrated sintering, carburizing and hardening operation during atmospheric sintering in order to save time and money in processing.

6. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amateau in view of Ladousse, in further view of U.S. Patent 4,972,735 issued to Torii et al. (hereinafter "Torii").

Amateau and Ladousse are applied to the claims as stated previously. Amateau and Ladousse do not specifically teach a method of making an intersecting axis gear, wherein the intersecting axis gear includes at least one of a straight bevel gear, a spiral bevel gear, a hypoid gear, a worm gear, and a worm-wheel gear.

However, it would have been obvious to one of ordinary skill in the art to have made an intersecting axis gear with the invention.

For example, Torii teaches a wrist assembly for an industrial robot (se Abstract). Torii teaches wherein the wrist assembly includes power transmission mechanism (see Abstract). Torii further teaches wherein the power transmission mechanism includes a hypoid gear (see Abstract, Figure 2, Col. 2, or claim 2, for example).

It would have been obvious to one of ordinary skill in the art at time of invention to substitute a powder metal gear blank as taught by Ladousse for the hobbed gear blank disclosed in Amateau, because Ladousse teaches that the powder metal blanks are economical to produce (see col. 7), and to use the method to manufacture the hypoid gear of Torii in order to provide a gear for making an improved wrist assembly

capable of obtaining a desired reduction gear ratio while decreasing the number of gears needed for transmitting power from the motor to the second wrist portion and the third wrist portion, as taught by Torii (see col. 2).

7. Claims 35, 37-39 and 41-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,779,270 issued to Sonti et al. (hereinafter "Sonti"), in view of Ladousse.

Regarding claim 35, Sonti teaches the invention substantially as claimed. Sonti teaches in claim 1,

1. A method of producing a full form net shape roll finished contacting machine element from a near net shape workpiece of wrought or forged steel having an initial outer peripheral contoured surface and including a plurality of teeth, each having a tooth flank with a nominally involute surface and a root/fillet region with a trochoidal surface, the method comprising the steps of:

rotatably supporting on a first axis a rolling die having an outer peripheral contoured surface extending between generally parallel spaced lateral surfaces transverse to the first axis, the rolling die including a plurality of teeth, each including a tooth flank with opposed involute surfaces and a tooth tip surface;

rotatably supporting the workpiece on a second axis distant from and parallel to the first axis;

advancing the rolling die in an in-feed direction generally perpendicular to the first and second axes such that the rolling die meshingly engages with the workpiece,

rotating the rolling die about the first axis while engaged with the workpiece;

while performing step (d), maintaining continuous conjugacy between the rolling die and the workpiece with the involute surface of each tooth of the rolling die engaging the involute surface of a mating tooth of the workpiece and the tooth tip of the rolling die engaging the trochoidal root/fillet surface between adjacent mating teeth of the workpiece to effect material flow along the outer peripheral contoured surface;

continuing to advance the rolling die in the in-feed direction thereby deforming the surface of each tooth flank and of a corresponding root/fillet region until a final net shape of each tooth and root/fillet region is achieved, and

continuing to perform all of the preceding steps with the rolling die and workpiece meshingly engaged, thereby deforming the involute and trochoidal root/fillet surfaces of all of the teeth of the workpiece resulting in a final net shaped machine element.

Sonti does not teach wherein the workpiece is a powder metal workpiece, or

(e) rolling the gear teeth surfaces of the workpiece to a desired outer peripheral profiled shape while engaged with the rolling die having an outer peripheral profiled surface while holding the workpiece at the uniform metastable austenitic temperature the gear teeth surfaces undergoing densification, plastic deformation, and strengthening as a result of the rolling and sliding operation.

Ladousse teaches a method of rolling gears from powder metal sintered blanks (see Abstract). Ladousse teaches that the method uses dies (tools) with a peripheral geometry designed to impart the appropriate shape to the powder metal blank (see cols. 1-3, cols. 11-12). Ladousse teaches that this may be done with opposed dies (tools) (see cols. 3-6, Figs. 1-5). Ladousse teaches that the method may be used to size or finish the gear shape (see cols. 11-12), thus meeting the limitation of each die having an outer peripheral powder metal gear tooth finishing surface configured to geometrically finish the powder metal surface of each tooth during rolling. Ladousse teaches that the use of sintered powder blanks is desirable because these are "very economical to produce" (see col. 7).

It would have been obvious to one of ordinary skill in the art at time of invention to substitute a powder metal gear blank as taught by Ladousse for the forged gear blank disclosed in Sonti, because Ladousse teaches that the powder metal blanks are economical to produce (see col. 7).

The limitation of the gear teeth surfaces undergoing densification, plastic deformation, and strengthening as a result of the rolling and sliding operation. Would be inherent in the process of Sonti shown above, if that step were performed as stated above on a powder metal gear blank (see MPEP §2112). Compaction under high temperature (hot working) is well established in the art to cause pores of a sintered PM workpiece to collapse and to cause the workpiece to plastically deform. The closing of pores is further known to cause strengthening in powder metal workpieces.

Regarding claim 37, additional steps (i) and (j) claimed by applicant would be inherent in the process of Sonti shown above, if that step were performed as stated above on a powder metal gear blank (see MPEP §2112). Compaction under high temperature (hot working) is well established in the art to cause pores of a sintered PM workpiece to collapse and to cause the workpiece to plastically deform.

Regarding claim 38, Sonti further discloses a process in claim 2:

> 2. A method as set forth in claim 1 including the step, before step (c) of:
> advancing the workpiece in a through-feed direction parallel to the first and second axes such that the outer peripheral contoured surface of the workpiece engages the outer peripheral contoured surface of the rolling die and continues to advance until the workpiece is positioned substantially coextensive with the rolling die in the through-feed direction.

Regarding claim 39, Sonti further discloses a process in claim 3:

> 3. A method as set forth in claim 2 wherein step (c) includes the steps of:
> simultaneously with step (g) after the workpiece and rolling die are substantially enmeshed, advancing the rolling die within a plane containing the first and second axes, in an in-feed direction substantially perpendicular to the first and second axes until the outer peripheral contoured surface of the rolling die engages the outer peripheral contoured surface of the workpiece at a near net shaped center distance establishing an initial center distance between the first and second axes when the workpiece and the rolling gear die are initially engaged; and
> continuing to advance the workpiece in the in-feed direction by an additional increment of center distance thereby deforming the profile surfaces of each tooth resulting in final net shape of the teeth.

Regarding claim 41, Applicant has stated in the specification, pages 22-23, that the difference between the technique as claimed for making the rolling dies and conventional techniques known in the art of making rolling dies is that "the die tooth profile maintains conjugacy in the root/fillet area of the gear tooth in addition to the area

of active contact" (p. 22). Sonti teaches "in order to maintain a constant anguar velocity, it is therefore necessary to produce on the rolling dies a tooth profile which is conjugate to the finished gear during all phases of the engagement" (see col. 6, lines 55-59). Sonti further discloses steps (a)-(h) of claim 41 (see col. 6, line 24- col. 8, line 12).

As for steps (i)-(p) of claim 41, Sonti and Ladousse are applied to the claim as stated in the claim rejections above.

Regarding claim 42, additional steps (q) and (r) claimed by applicant would be inherent in the process of Sonti shown above, if that step were performed as stated above on a powder metal gear blank (see MPEP §2112). Compaction under high temperature (hot working) is well established in the art to cause pores of a sintered PM workpiece to collapse and to cause the workpiece to plastically deform.

Regarding claim 43, Sonti teaches the invention substantially as claimed in claim 6:

6. A method of producing a full form net shape roll finished contacting machine element from a near net shape workpiece of wrought or forged steel having an initial outer peripheral contoured surface and including a plurality of teeth, each having a tooth flank with a nominally involute surface and a root/fillet region with a trochoidal surface, the method comprising the steps of:

rotatably supporting on first and second generally parallel spaced axes, first and second rolling dies, each having an outer peripheral contoured surface extending between generally parallel spaced lateral surfaces transverse to the first axis, each rolling die including a plurality of teeth, each tooth including a tooth flank with opposed involute surfaces and a tooth tip surface;

rotatably supporting the workpiece on a third axis distant from and parallel to the first and second axes;

advancing the first and second rolling dies, within a common plane generally containing the first, second, and third axes in respectively opposite in-feed directions generally perpendicular to the third axis until the rolling die meshingly engages with the workpiece,

rotating the rolling dies at a constant angular velocity about their associated first and second axes while engaged with the workpiece;

while performing step (d), maintaining continuous conjugacy between each of the rolling dies and the workpiece with the involute surface of each tooth of each of the rolling dies engaging the involute surface of a mating tooth of the workpiece and the tooth tip of each of the rolling dies engaging the trochoidal root/fillet surface between adjacent mating teeth of the workpiece to effect material flow along the outer peripheral contoured surface;

continuing to advance each of the rolling dies in the in-feed direction thereby deforming the surface of each tooth flank and of a corresponding root/fillet region until a final net shape of each tooth and of each root/fillet region is achieved, and

continuing to perform all of the preceding steps with the rolling dies and workpiece meshingly engaged, thereby deforming the involute and trochoidal root/fillet surfaces of all of the teeth of the workpiece resulting in a final net shaped machine element.

Ladousse is applied to the claim as stated above.

Regarding claim 44, additional steps (i) and (j) claimed by applicant would be inherent in the process of Sonti shown above, if that step were performed as stated above on a powder metal gear blank (see MPEP §2112). Compaction under high

temperature (hot working) is well established in the art to cause pores of a sintered PM workpiece to collapse and to cause the workpiece to plastically deform.

Regarding claim 45, Sonti further discloses in claim 7:

> 7. A method as set forth in claim 6 including the step, before step (c) of:
>
> advancing the workpiece in a through-feed direction parallel to the first, second, and third axes such that the outer peripheral contoured surface of the workpiece engages the outer peripheral contoured surface of each of the rolling dies and continues to advance until the workpiece is positioned substantially coextensive with the rolling dies in the through-feed direction.

Ladousse is applied to the claim as stated in rejections above.

Regarding claim 46, Sonti further discloses in claim 8:

> 8. A method as set forth in claim 7 wherein step (c) includes the steps of:
>
> simultaneously with step (g) after the workpiece and rolling die are substantially enmeshed, advancing the rolling die within a plane containing the first and second axes, in an in-feed direction substantially perpendicular to the first and second axes, until the outer peripheral contoured surface of the rolling die engages the outer peripheral contoured surface of the workpiece at a near net shaped center distance establishing an initial center distance between the first and second axes when the workpiece and the rolling gear die are initially engaged; and
>
> continuing to advance the workpiece in the in-feed direction by an additional increment of center distance thereby deforming the profile surfaces of each tooth resulting in final net shape of the teeth.

Ladousse is applied to the claim as stated in rejections above.

Response to Arguments

8. Applicant's arguments filed 4 March 2008 have been fully considered but they are not persuasive. Applicant has argued that the prior rejection does not address all

limitations of the claims. These arguments have been considered but are moot in view of the new ground(s) of rejection.

The declarations under 37 CFR 1.132 filed 4 March 2008 and 21 December 2007 are insufficient to overcome the rejection of the claims based upon Amateau and Sonti as set forth in the last Office action because: applicant has shown data comparing gears made by the instant invention with wrought steel gears and powder metal gears made by a different process. These data have been carefully considered, however, they do not rebut the prima facie case of obviousness established. An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). "A comparison of the claimed invention with the disclosure of each cited reference to determine the number of claim limitations in common with each reference, bearing in mind the relative importance of particular limitations, will usually yield the closest single prior art reference." *In re Merchant,* 575 F.2d 865, 868, 197 USPQ 785, 787 (CCPA 1978) (emphasis in original). Where the comparison is not identical with the reference disclosure, deviations therefrom should be explained, *In re Finley*, 174 F.2d 130, 81USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. *In re Armstrong*, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from example were inconsequential).

In the instant case, the comparison gears (i.e., gears made from wrought or powder metal gear blanks by the "conventional" methods) do not include the step of

rolling at austenitic temperatures, as claimed (see for example, claim 19, step (c) or claim 35, step (e)). The prior art cited in the rejection (Amateau or Sonti) teaches quite clearly that the process including ausforming yields the superior result of gears with better mechanical properties. Thus it would be fully expected that processes of making gears without ausforming would yield gears of inferior properties to an ausformed gear. Applicant has chosen to compare the gears made by the process of the instant invention to gears made by processes which do not include ausforming. However, this showing is insufficient to rebut the prima facie case of obviousness. Applicant has not explained why the comparison was made between gears made by the instant process and gears which were made by a process that does not include ausforming.

Applicant has argued in the Remarks of 4 March 2008 that the prior art cited by the examiner is not the closest prior art, but that a "conventional powder metal gear would be the closet prior art" (see pp. 19-20). Although the examiner acknowledges that the art relied upon (Amateau or Sonti) does not envision the use of powder metal gear blanks, but this art is still the closest prior art. As cited above, Amateau teaches full-form roll finishing of gears and rolling at austenitic temperatures as claimed. The "conventional" process teaches neither of these steps. Thus, the major difference in the cited prior art and the invention is the type of gear blank in the process. The major difference in the "conventional" powder metal gear rolling process is the lack of an ausforming step and the lack of a roll finishing step. Applicant has not explained how or why these differences would be inconsequential to the inferior results shown in the

declaration. In the declaration of Dr. Nagesh Sonti under 37 CFR 1.132 filed 4 March 2007, applicant stated at page 3:

> 7. The unexpectedly better performance of ausformed powder metal steel gears over conventional powder metal gears can be attributed to the enhanced accuracy and surface finish of ausformed powder metal gears created by the powder metal gear tooth finishing surface of the dies claimed in the methods of the present application, as well as increased strength due to ausforming effects of Applicant's methods.

Thus applicant has stated that the ausforming has resulted in better properties. This feature is present in the cited prior art, but not present in the comparison examples. Thus, by applicant's own admission, the method including ausforming and roll finishing taught by the prior art as cited would be expected to result in gears of superior mechanical properties, and the "conventional" process lacking this step is not closer than the art cited.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

csk